

# PSE Newsletter, Fall 2014



As you've likely heard by now, this fall marks the "kick off" of PSE50, a multi-year celebration of the 50th anniversary of PSE at UMass. In 1966, the graduate program in Polymer Science and Engineering was officially started, with Roger Porter appointed as its head and the first class of doctoral students admitted. The department has collectively decided to mark this significant anniversary with a reflection on the first 50 years and how these inform our vision for the PSE in the next half-century. In this spirit, along with news and announcements traditionally reported in the fall newsletter (dept. highlights, newest alumni, etc.) this issue features items relevant to PSE50 events and themes. This includes a multi-part historical retrospective of PSE, the first installment of which, authored by Prof. Bill MacKnight, is featured on pages 2-3.

During the 50th academic year of the program (Fall 2015-Spring 2016), PSE50 events will celebrate the founding and evolution of the program, the important scientific and technological achievements of its alumni and faculty, and the long-term impact the program has had on interdisciplinary education in polymeric materials. Please take the time to review the preliminary calendar of PSE50 events on page 5. The culmination of these events will be the PSE50 Reunion on May 12-13, 2016, a two day gathering in Amherst of current and former students, postdocs and faculty of PSE. More details about this reunion and other PSE50 events will soon be released. Mark your calendar and stay tuned!

A key component of the 50th anniversary celebration is the 3-year PSE50 Campaign. This campaign asks alums to renew their connections to current and future generations of PSE students through sustainable contributions that support 1st-year stipends. Each year, the support of 1st-year students remains, by far, the largest expense on the departmental budget. This guaranteed support is as vital to a rigorous training in polymeric materials today as it was in your time because it allows 1st-year students to focus exclusively on coursework and cumulative exam preparation, without

the responsibilities of a TA- or RA-ship. The response to our appeal, so far, has been strong (see page 10). As of press time, we have quickly received contributions surpassing **81%** of our \$50,000 Year 1 goal, though we remain far below our ambitious goal to reach 50% alumni participation, with **76 alums** contributing thus far. We thank everyone who has donated to the department this year, and in recent years. Your generous support provides direct and critical support to students who are following in your footsteps.

On a related note, we've received numerous enthusiastic reactions to the "offer letters" that were mailed out at the end of September, with alums of different generations sharing so many stories, memories and reflections on the start of their time in PSE. As we roll on towards the 50th anniversary, we encourage all of you to continue to discuss these stories, share them with us and to consider sharing them with fellow alums via the PSE LinkedIn page\* or your preferred social networking platform.

I'm proud, and grateful, for my chance to play a small part in the distinguished, 50-year history of Polymer Science and Engineering at UMass. I hope you too share this enthusiasm and will join me, and other members of the PSE faculty, students and alumni to celebrate the continuing legacy of this unique program through your participation in PSE50 events and your support of the PSE50 campaign in the coming years.

*PSE Newsletter Editor*

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\*[www.linkedin.com/groups/UMass-Polymer-Science-Alums-Affiliates-41079/](http://www.linkedin.com/groups/UMass-Polymer-Science-Alums-Affiliates-41079/)

# The History of Polymers at UMass

As the 50th anniversary of the PSE program approaches, we take the opportunity reflect on the evolution of polymer research and education at UMass through a series of retrospectives written by PSE faculty and alumni. **Prof. Bill MacKnight**, who was there from the inception of the program and who served as department head for many years starting in 1976, authors the first in this series. Here, he revisits the origins and early history of PSE. Future installments will address subsequent time frames as well as the current day. As Alumni, you are both the creators and the embodiments of the PSE legacy. We would be grateful to hear from you regarding your recollections, further to, receive any copies of photographs and other documentation you may have to contribute to the history of the first half century of PSE.

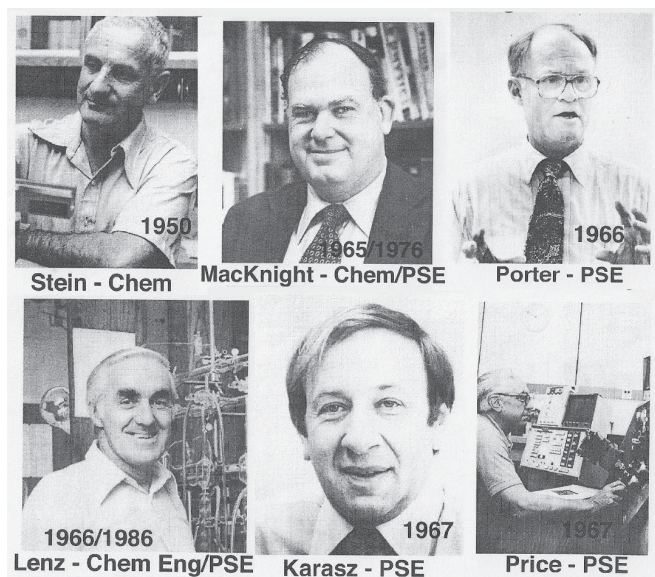
## The early years: pre-1966 to 1982 by W. J. MacKnight

**Polymer research at UMASS** dates from the early 50's when Richard Stein arrived as an Assistant Professor of Chemistry. Before that time, in the late 19th century, the vision for research at our land grant university was established by Charles Goessmann (1827-1910), who developed an internationally recognized program in agricultural chemistry, and served, among other roles, as the President of the ACS. In this context, the establishment of the polymer research program in the mid-20th century marks something of a realignment of the research strength of the university with a critical sector of the Commonwealth economy during the 20th century.

Beyond the establishment of a polymer research program, Richard Stein can be credited with starting the university's computer center, and further, with reestablishing and modernizing the physical chemistry curriculum at UMass. In 1961, he established the Polymer Research Institute (PRI) at UMass (only the 2nd such entity in the US at that time), which was to be vital for consolidating polymer research efforts on campus for decades.

Immediately following the 1965 appointment of William MacKnight as Assistant Professor of Chemistry, Stein and MacKnight began to design a Polymer Science and Engineering Program. The program was approved in 1966 as an interdisciplinary effort with authority to confer M.S. and Ph.D. degrees. By the beginning of the fall semester of 1966, Roger Porter was in place as Head and sole faculty member of PSE. In the same year, Robert Lenz, an organic polymer chemist, was hired in Chemical Engineering. These original four were united through their common interests in polymer research, and more formally, through their membership in the PRI. At that time, the first graduate students were admitted to the PSE program and the requirements for the Ph.D. were formalized. Critical elements of the curriculum were established at that time, notably the cumulative exam system, which remains in place to this very day.

From the start, issues of funding and suitable research space were paramount. To expand the funding capacity provided by federal grants held by PRI members, a

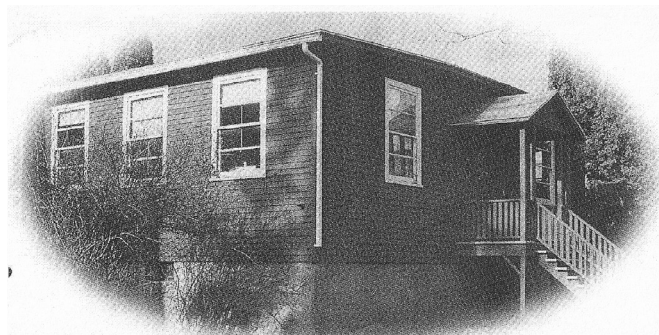


Original members of the PSE "team".

campaign was mounted to raise money from industry, including Monsanto which was then located in nearby Springfield, MA. Industrial money was used mainly to support graduate students, and, in those early years, it was possible to provide stipends for all PSE graduate students throughout their studies through industrial fellowship dollars. May 1969 marked a critical milestone for the program, the awarding of the first Ph.D. in PSE to Tisato Kajiyama, who was admitted in the first PSE class.

At the start of the program, research space was provided by the home departments of PSE faculty, while Porter, whose appointment resided with the program rather than a department, was allocated space by the Graduate Dean. Needs for usable research space became more critical with the arrival of Jack Carmichael and Frank Karasz as PSE faculty members in 1967. After considerable negotiation, both were allocated lab space in Chemistry, though the issue of space immediately reemerged in 1968, when Fraser Price was added to the PSE Faculty. In search of a "home base" for PSE, Karasz and Carmichael identified an old, disused building named Draper Annex as possible faculty office space. Following renovations of the building, offices were provided for the PSE Faculty members (Porter, Price, Karasz and Carmichael). Employing his considerable carpentry





The Draper Annex, home of PSE circa 1969.

skills, Price outfitted a small laboratory in Draper Annex, which served as the primary location for the Polymer Laboratory courses for many years.

With a permanent, if somewhat ramshackle, home on campus, PSE began to expand rapidly. In 1969, Robert Laurence and Stanley Middleman joined the Chemical Engineering Department. Both brought their interest in polymers to UMass and to the PRI, Laurence in polymer reactor design and Middleman in rheology and fluid mechanics. In 1970, Jack Carmichael departed and was replaced in PSE by Otto Vogl, while J.C.W. Chien (also a PRI member) joined the Chemistry Department that same year. By the end of 1972, when Isaac Sanchez joined PSE, the UMass Polymer program consisted of 5 PSE faculty members and 6 affiliated faculty in Chemistry or Chemical Engineering. While Porter was the Head of PSE, Stein, as director of the PRI, continued to have important impact on the direction of the polymer program, from his appointment in Chemistry, which he maintained throughout his career.

The establishment, in 1973, of the Materials Research Laboratory (MRL) with funding from the National Science Foundation (NSF) was a transformative factor in the rise of PSE. A number of prior MRL's existed in the US, which up to that point had been funded through the defense department, but the program was being transferred to NSF control. As a result of a national competition, UMass was awarded the first and only MRL devoted to polymers, with Porter and Karasz appointed co-directors; participation was open to all faculty working on polymer materials. The MRL played an important part in putting PSE "on the map" in the materials research world. It provided crucial and sustained funding for major research instrumentation purchases and the resources to maintain them. Stimulated by the awarding of the NSF center, UMass hired Richard Farris, a civil engineer working on polymers who was appointed to the Civil Engineering Department. The MRL, later renamed the Materials Research Science and Engineering Center (MRSEC) endured at UMass for over 40 years with NSF funding.

As a result of administrative action, PSE was reconstituted as a Department in 1974, and moved from the Graduate School to the Faculty of Natural Science and Math-

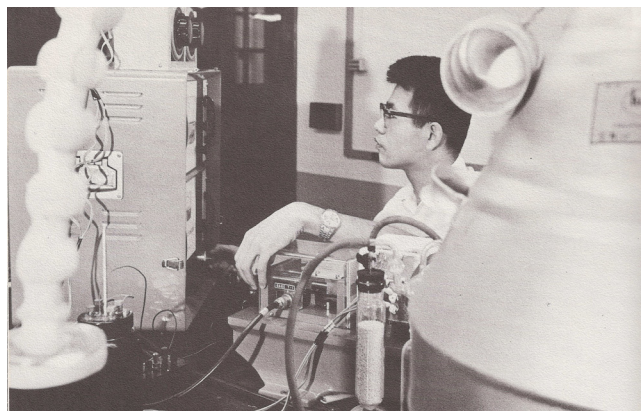
ematic (FNMSM). Then as now, PSE differed from the other departments in the college in that it lacked an undergraduate major and contained an engineering component. At about this time, PSE was relocated to two floors of the new Graduate Research Center (GRC) in the Lederle Tower, a considerable upgrade in the quality of research space available to the department.

1976 saw the untimely death of Fraser Price of a fatal heart attack. When Price arrived at UMass he was already well known for his work in polymer morphology and he contributed greatly to the development of PSE during his all too short tenure. Also in 1976, Porter stepped down as the first head of PSE, and MacKnight moved from Chemistry to PSE to become the new department head.

At this time PSE was somewhat of a "Hydra-Headed Monster", with at least three administrative centers supporting polymer research, each associated with distinct funding sources: the PSE department headed by MacKnight; the MRL with Porter and Karasz as co-Directors; and the PRI directed by Stein in Chemistry. Further complicating matters somewhat, those faculty outside of PSE (Stein and Chien in Chemistry and Laurence, Middleman and Lenz in ChemE) regularly attended PSE faculty meetings, directed PSE students and were members of the MRL and PRI. Several PSE faculty appointments came about in the late 1970s. Following the loss of Price and the departure of Sanchez in 1977, Edwin L. Thomas and Shaw Ling Hsu joined the PSE department in 1977 and 1978, respectively.

Finally, the start of the 1980's saw the establishment of another important center for polymer research at UMass, the Center for UMass Industry Research on Polymers (CUMIRP). This center, awarded in 1982, was the result of a NSF initiative to promote Industry-University collaboration. Co-chaired by Stein and Vogl and directed by Eugene Magat, a long time duPont employee, CUMIRP was initially jointly funded by NSF and many of the largest industrial firms in polymers and related fields.

*In the next issue: PSE enters a new building and new century.*



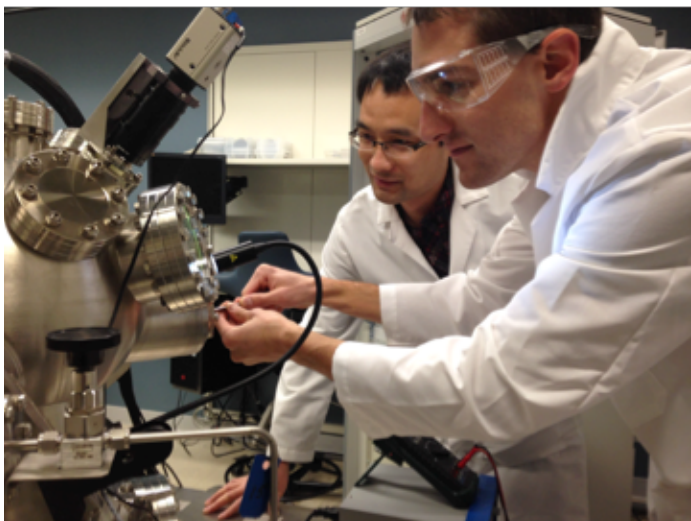
Then PSE Ph.D. candidate, Tisato Kajiyama, operating the "Rheovibron" in the MacKnight lab, in Goessmann.

## PSE Highlights

### Energy research with polymers: PSE researchers combine polymers with zwitterions to achieve high efficiency solar cells

Zachariah Page, now in his fifth year in Todd Emrick's group in PSE, has discovered a new set of synthetic polymers that afford high efficiency bulk heterojunction solar cells, with power conversion efficiency exceeding 10%.

Zak's thesis work began with attempts to prepare new polymers for the active layer of solar cells, but shifted quickly when he found that the conjugated polymer zwitterions (CPZs) he was preparing significantly modified the electronic properties of metal electrodes. CPZs lower the work function of stable (high work function) metals, such as Ag, Cu, and Au, to values that make them suitable for use as the cathode in the simplest type of polymer solar cell design (single junction devices). Fabricating solar cells from stable metal electrodes, with high efficiencies enabled by ultrathin (5-10 nm) polymer coating layers, is a timely and important advance in the field and will improve the practicality of solution processible polymer-based devices. Zak's syntheses initiated collaborative projects with Feng Liu and Dr. Yao Liu, both in Tom Russell's group working on solar cell design and fabrication, and with physicist and facility director Dr. Volodymyr Duzhko. Zak's project began with the synthesis of sulfobetaine-substituted polythiophenes, but has since expanded into a large library of CPZs, and recently to zwitterion-substituted fullerenes.



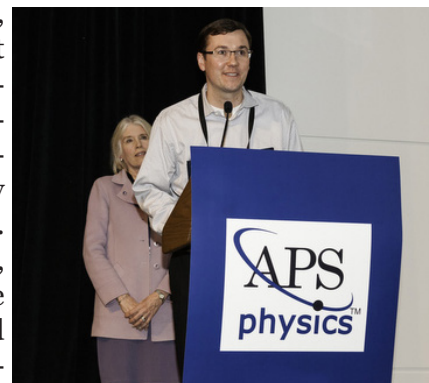
PSE researchers, Yao Lui (left) and Zachariah Page (right) working in the Energy Frontiers Research Center laboratories for solar cell fabrication using new polymers for electrode modification.

These structures satisfy all of the requirements of cathode modification layers, impacting electrode work function, enabling easy processing in conjunction with the polymer active layer, and exhibiting an ability to function as electron selective layers in the device. Read more about Zak's work in several published manuscripts, including *Macromolecules* (2013), *Advanced Materials* (2013) and *Science* (2014).

### Hayward receives Dillon Medal

In March 2014, PSE faculty member, Ryan C. Hayward was awarded the 2014 John H. Dillon Medal by the Division of Polymer Physics (DPOLY) of the American Physical Society (APS). The Dillon Medal recognizes outstanding research accomplishments by young polymer physicists who have demonstrated exceptional research promise early in their careers. According to the APS award citation, Hayward was recognized "For remarkably innovative and creative approaches to the design, realization, and analysis of responsive polymer gels and self-assembled systems."

The Dillon Medal, arguably the most prestigious early-career award in polymer physics, was established in 1983 by the APS and DPOLY. Beginning in 1997, sponsorship of the medal was assumed by Elsevier, publishers of the journal *Polymer*. Hayward and APS President, Kate Kirby (*background*), at the 2014 APS meeting, consists of a bronze medallion, and a certificate citing the accomplishments of the recipient, and comes with a \$2,000 honorarium and a \$1,000 travel allowance to attend the APS meeting. Hayward, whose previous honors include an NSF CAREER Award, a DOE Early Career Award and the Presidential Early Career Award for Scientists and Engineers, is the third PSE faculty to receive the Dillon medal, the two previous PSE awardees being M. Muthukumar in 1986 and Helmut Strey in 2003.



Hayward's research covers a variety of topics in polymers and soft materials, with a particular focus on thin films and interfaces. Recent areas of interest include swelling-induced deformation of constrained and micro-patterned stimuli-responsive gels, and solu-



tion-phase self-assembly of polymer-particle, composite nanostructures. The awarding of the Dillon Medal was marked by a special symposium held in celebration of Ryan's award at the 2014 APS March Meeting in Denver, co-organized by Prof. Thomas Russell (UMass) and Prof. Edward Kramer (UCSB), highlighting research contributions from invited colleagues, collaborators and mentors in the areas of polymeric materials assembly and responsive soft materials.

## Misra returns to PSE as Adjunct Faculty member

Capping a distinguished academic and business career in his native India, PSE alumnus Prof. Ashok Misra joined the PSE faculty in 2014 as an Adjunct member. Holding a B.Tech. from IIT Kanpur and a M.S. from Tufts University, Misra entered the PSE program in 1970 and received his Ph.D. in 1974, for a dissertation work with Dick Stein on crystallization and deformation of PET. After UMass, Misra worked for 3 years at Monsanto in nearby Springfield, Massachusetts; during this time he maintained regular interactions with PSE. In 1977, he returned to India, as a faculty member IIT Delhi where he stayed until 2000, guiding 22 doctoral students, co-authoring a book, and publishing 175 peer reviewed articles. In 2000, he was appointed to the prominent position of Director of IIT Bombay, which he held for eight years. In 2008, Misra stepped down from the IIT directorship and joined Intellectual Ven-

tures, where he is currently the Chairman for India. Prof. Misra has received numerous honors—including distinguished alumnus awards from UMass, IIT Kanpur and Tufts—and continues to hold numerous influential professional positions, including Fellowships in the Indian National Academy of Sciences—where he served as President in 2006-08—and the Indian National Academy of Engineering.



Prof. Ashok Misra, PSE alumnus—where he served as President in 2006-08—and the Indian National Academy of Engineering.

Through his adjunct position at UMass, Prof. Misra is eager to reconnect with his PSE roots, and bringing back to Amherst a career's worth of academic and commercial research expertise and a deep network of connections to the science and engineering community in India. This past July (2014), Prof. Misra visited the department for the first time in this capacity, giving a series of lectures on the structure and processing of polymer composites, and meeting with the current generation of PSE students and postdocs.

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## PSE50 Calendar of Events

A preliminary listing of PSE50 events is included below. Please visit [www.pse.umass.edu/PSE50](http://www.pse.umass.edu/PSE50) for up to date information about further events to be added to roster and up to the date details.

*August 16-19, 2015*

**“Celebrating 50 years of polymer research at PSE UMass”**, scientific symposium and dinner event at 2015 ACS Fall Meeting, Boston

*August 20-21, 2015*

**90th Birthday Celebration for Richard Stein**, symposium hosted by PSE & Chemistry at UMass Amherst

*September 2015- May 2016*

**PSE50 Distinguished Alumni Seminar Series**, hosted during Fall 2015 and Spring 2016 semesters at PSE

*May 12-13, 2016*

**PSE50 Reunion**, 50th Anniversary Celebration at UMass Amherst

**PSE  
50**

## PSE Voices

For this issue, we posed a single question to four current and two former students from PSE about their experiences in the department. The responses from our “future alumni” and “former students” are featured below.

*“How have your PSE peers benefited your education, research or post-PSE career? What was the most valuable contribution this group, or key individuals, have made?”*

### Chinomso Nwosu

**Hometown:** Umunoha, Imo State, Nigeria

**Undergrad:** Fed. Univeristy of Technology, Owerri, 2008 (PS&E)

**Group:** Coughlin

**Research:** diffusion in quaternized PS-b-P4VP



Having studied in three continents and four countries I have come to appreciate the French motto: Liberty, equality and brotherhood. Brotherhood (i.e close knit social groups), I have found to support my life in general. After suffering from bouts of ‘culture shocks’ in France and Germany, I came to US thinking that for a period I just have to experience the same. Surprisingly and fortunately, it was not the case. A week after my arrival to PSE, I had seamlessly transited into the Amherst way of life. A feeling of home away from home. The presence of a fellow PSE graduate student and fellow compatriot, Kachi, no doubt played an important role in this feeling. Furthermore, the PSE club social programs instilled a valued feeling of camaraderie.

As incoming first year students, not knowing what lies ahead, group studies provided academic balance. Being of completely distinct backgrounds meant looking at the same challenges through a mosaic of experiences. For once I could look at the chemistry story from an engineering perspective. This balance has so far been exciting and adventurous thanks to first-year peers like Santa, Rohit, Parker, and so many others.

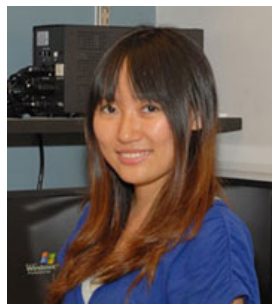
### Yan Wang

**Hometown:** Xi’an Shaanxi Province, China

**Undergrad:** Tsinghua Univ., 2007 (Polymer Mat. & Eng.)

**Group:** McCarthy

**Research:** silicone chemistry, surface science, transport through thin films



Based on my experiences here, I’ve come to suspect that one important factor that makes PSE a prestigious department is undoubtedly the collaborative environment and strong the interactions amongst people. I started creating a strong bond with my classmates during my first year in the department. Group studies

were so valuable during that first year, and we formed a tight knit studying group since the first cumulative (CUME) exam preparation. At the time I was amazed by how differently the way a chemist and a material scientist approached the same problem. From this interactive study, I learned new ways of thinking “outside the box,” which was helpful when it came time to approach open-ended research problems. The team spirit and friendship fostered during that year has been of great help and a great source of inspiration in my research. No matter what type of characterization methods or techniques I needed, I always knew exactly who was the right person to ask, and most important, my peers are always willing to help, enthusiastic to share their new expertise. Sometimes inspiration for great collaborations were generated simply through student interactions take place during brief instrument training sessions. I will always be proud that I have collaborators from engineering, physics and chemistry groups in PSE, which I hope will help me to broaden the impact of my work as I begin my professional research career outside of PSE.

### Rachel Letteri

**Hometown:** Warrington, VA

**Undergrad:** Notre Dame, 2010 (Chem. E.)

**Group:** Emrick & Hayward

**Research:** polyelectrolyte synthesis for interfacial assembly and gene delivery



As a 1st year, my PSE peers were classmates, first friends in a new town, roommates, cooking instructors, older graduate students that I highly looked up to, and softball teammates. The class of 2010 is tremendous in size (we are ~25), but also in science (some of the smartest people I know) and especially in friendship. We had so much fun becoming friends and going through classes (even cumes) together.

As a 2nd year, my PSE peers were my best friends, roommates, softball teammates, and group mates (aka they taught me a ton of science and beer drinking!). I need to emphasize my group mates, as they constantly answered (and continue to answer) my sometimes extremely basic questions and helped me in lab when I was not completely comfortable with a particular reaction or experiment. More importantly, they were, and



continue to be, outstanding mentors and best friends.

As a rising 5th year (ah!), my PSE peers have become my second family, my roommates, people I hope to work with throughout my future career, my Friday night dinner plans, my companions for writing at coffee shops, and outstanding scientists that continue to be wonderful friends.

Working toward a Ph D without best friends, roommates, coffee break companions, the best group mates, mentors, classmates, Friday night dinner plans, and cooking instructors? Near impossible.

### Isaac Bruss

**Hometown:** Bradford, NH

**Undergrad:** Hampshire College, 2010 (Nanophysics)

**Group:** Grason

**Research:** theory & simulations of filament assembly



During my years here in PSE I have found that all of my peers are also mentors. Whether it is helping to study for the cumes, providing comments on a manuscript draft, or teaching a new lab technique, there is always someone available to provide help and share their expertise. Because we are such a diverse department, everyone is an expert at something unique and therefore has something to offer. Additionally, we have an open and friendly atmosphere that encourages the exchange of ideas. This was most apparent for me in the advanced topics seminar on “Scientific Management”. Part of this course was designated to assist students formulating and outlining their Original Research Proposals, where everyone came up with multiple proposals and presented them to the rest of the class. I was surprised at how useful this exercise was mostly because of the high level of critical and constructive feedback. Overall I feel that my peers have made my experience at UMass truly exceptional, one that I expect would be hard to duplicate outside of an interdisciplinary program like PSE.

### Douglas Holmes

**PSE Entering Year:** 2004

**PSE Advisor:** Crosby

**Current Position:** Asst. Prof., Mech. E., Boston Univ.



Five years out and it seems like a connection to PSE is never far. I've met with PSE colleagues at research labs in Paris, and run into them at conferences as far-flung as Beijing. At the meetings I attend annually, I look forward to the opportunity to get a research update from

fellow PSE alums and to be introduced to the newest class of students. It is both grounding and familiar to know this network exists and is thriving. Beyond my interactions with students and alumni, I wasn't prepared for how encouraging and supportive the PSE faculty would be as I entered their ranks. From my PhD advisor (Crosby), to my committee, to all the department's professors, I felt like a colleague upon graduation. As a faculty member now, I can't hide my biases towards PSE - I often speak highly of my time there, and encourage like-minded undergraduates to consider a similar path. And for me at least, the PSE network has been personal as well as professional - Ryan Murphy (PSE entering year, 2002) officiated my wedding, marrying my wife and I. Five years out and I don't feel like I'm ever far from my PSE colleagues, and I'm certain that will continue.

### Dave Flanagan

**PSE Entering Year:** 1995

**PSE Advisor:** Dave Tirrell

**Current Position:** Product manager Wiley Science Solutions (previously Ed. in Chief of *Advanced Functional Materials*)



I celebrated my ten-year work anniversary in August. A friend commented, “Pretty soon you'll surpass the time you spent as a grad student!” Haha, funny. But he went on to speculate that the reason why my career took off as a journal editor was because I spent so much of that time in grad school reading papers. I guess there's some truth to that. But looking back it wasn't reading articles that jumpstarted my career, it was the people.

Such a long graduate career — thanks in no small part to a very patient advisor — meant that I got to know lots of really smart people, fellow students who passed through the lab and went on to join top universities and companies. “Networking” sounds like something B-school suits and “serial entrepreneurs” do. I didn't think of myself as networking, I just had friends at PSE. When I needed an Advanced Materials referee report, or a review on a cutting edge topic, I was the new guy whose buddy happened to be an award-winning professor. Now, when I have a product feature to test, I can phone a friend who's also a research director at a big company.

So, my advice to current PSE students is to keep in touch with your fellow alumni after graduation. You'll never be bored at a conference, and you just might be able to help one other's careers, too.

# PSE Graduates

(November '13-October '14)

**Xiaodan Gu** (T. Russell)

December 18, 2013

“Self-Assembly of Block Copolymers By Solvent Vapor Annealing, Mechanism and Lithographic Applications”

**Samantha McRae** (T. Emrick)

January, 21 2014

“Functional Phosphorylcholine Polymers: Prodrugs and Biomaterials”

**Feng Liu** (A. Briseno & T. Russell)

January, 22 2014

“Morphology Characterization of Low Band Gap Polymer based Organic Photovoltaics”

**Andrew Davis** (K. Carter)

January 29, 2014

“Visualizing and Controlling Charge Transport in Conjugated Polymer Networks and Films”

**Choel Hee Lee** (A. Crosby, T. Emrick & R. Hayward)

February 3, 2014

“Motion of Particles as a Probe: Dynamics and Assembly in Gel Networks/Aqueous Media”

**Dayong Chen** (R. Hayward)

February 21, 2014

“Creasing Instability of Hydrogels and Elastomers”

**Caroline Miesch** (T. Emrick)

May 2, 2014

“Liquid-liquid Interface Stabilization with Functional Nanoparticles: Double Emulsions, Emulsion Inversion and Robust Capsules”

**Sirinya Chantarak** (T. Russell & T. Emrick)

May 5, 2014

“On The Assembly of Functionalized CdSe Nanorods”

**Yu Gu** (T. Russell)

May 8, 2014

“On the Morphology of Polymer-based Solar Cells to Achieve Higher Device Performance”

**Michael Lis** (G. Tew)

May 12, 2014

“Guanidinium-Rich ROMP Polymers Drive Phase, Charge, and Curvature-Specific Interactions with Phospholipid Membranes”

**Polina Ware** (A. Lesser)

May 21, 2014

“Polymer Modification with Multifunctional Additives and Unique Processing Methods”

**Xinyu Yang** (J. Watkins)

July 1, 2014

“Functional Nanocomposites From Self-Assembly of Block Copolymers with Nanoparticles”

**Zhan (Henry) Wang** (A. Lesser)

July 9, 2014

“Evaluating Effects of Molecular Heterogeneity On The Non-Linear Mechanical Behavior of Epoxy Networks”

**Dong Chen** (M. Santore)

August 6, 2014

“The Impact of membrane Tension on Phase Separation and Solid Domain Properties in Model Multicomponent Vesicles”

**Cathy Walker** (G. Tew)

September 5, 2014

“Bicontinuous Materials from Telechelic Macromonomers Using Thiol-ene Chemistry”

**Xiabo Shen** (T. Russell)

September 10, 2014

“On the Ordering, Microstructure and Hole Transport Correlations in Semicrystalline Poly(3-hexylthiophene)”

**Lang Chen** (H. Bermudez)

September 19, 2014

“Aggregation and Interfacial Behavior of Charged Surfactants in Ionic Liquids”

**Sami Fakhouri** (A. Crosby)

September 24, 2014

“Cavitation and Puncture for Mechanical Measurement of Soft Solids”

**Andreas Kourouklis** (H. Bermudez)

October 3, 2014

“Cell Adhesion Biophysics on Dynamic Polymer Constructs”

**Yan Wang** (T. McCarthy)

October 6, 2014

“Synthesis, Characterization and Surface Modification of Polydimethylsiloxane and Its Composites”

**Irem Bolukbasi** (T. Emrick)

October 15, 2014

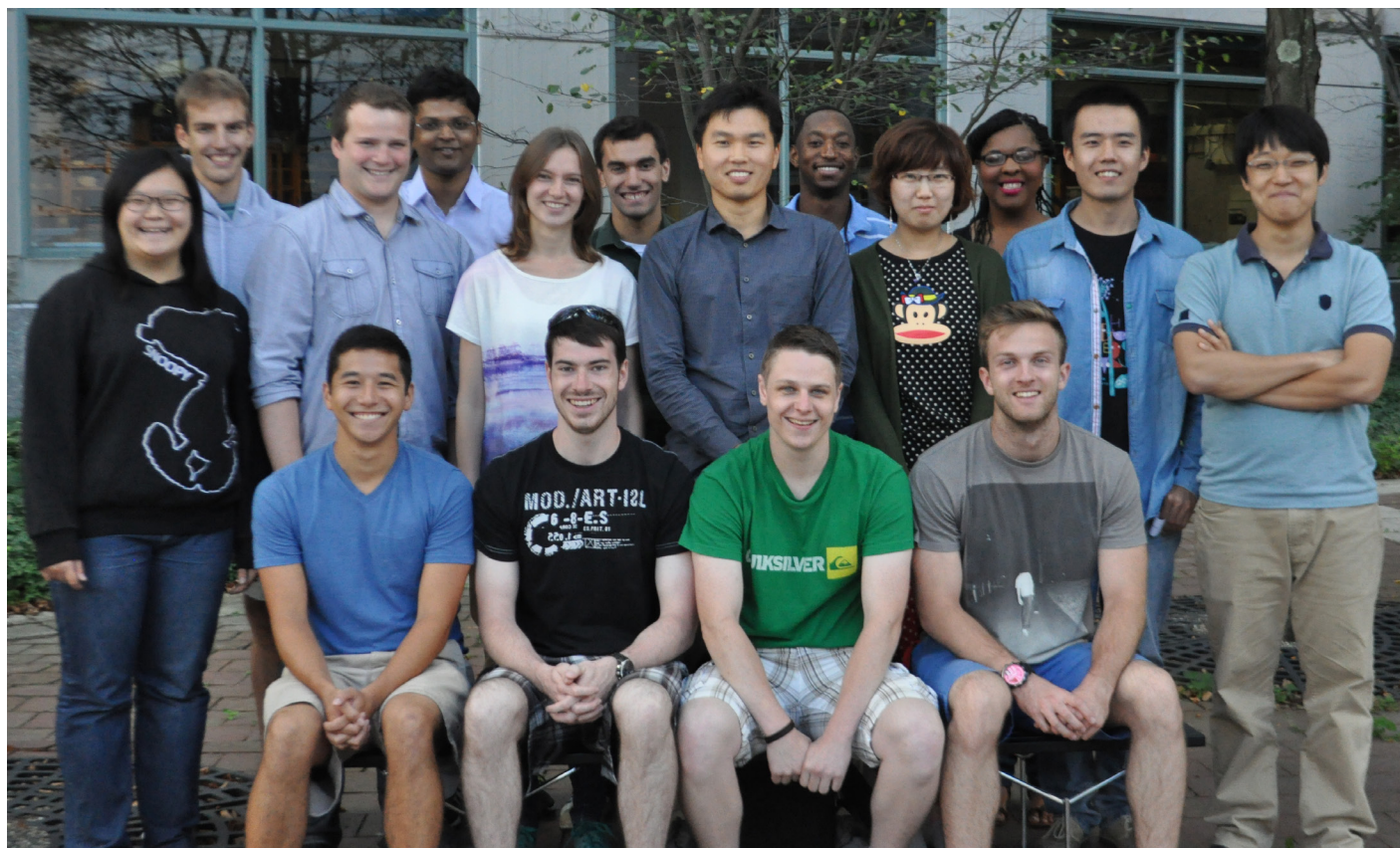
“Tailoring nanoparticles and polymers for cooperative interfacial and surface interactions”

**Jimmy Lawrence** (T. Emrick)

October 24, 2014

“Functional Nanostructures from Nanoparticle Building Blocks”





**49th PSE Entering Class:** (back row, from left) David Ferreira, Subrajeet Deshmukh, Michael Kwansy, Marcus Cole, Kasey Campbell; (middle row) Qi Lu, Matt Lampe, Ronja Otter, Yongjin Kim, Yige Gao, Wenhao Li, Hyunki Kim; (front row) Joshua Enokida, Jens Markwart, Yannick Nyquist, Phillip von Tiedemann

## Student Honors

**Coralie Backlund** - NSF East Asia Pacific Summer Institute Fellowship

**Yue Gai** - Arkema Fellowship

**Jared Harris** - NSF Graduate Research Fellowship

**Daniel King** - Peebles Award, Adhesion Society; Eugen M. Isenberg Scholar Award

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**Shruti Rattan** - Best Poster, 2nd Prize at 2014 NEW Mech Workshop

**Joel Sarapas** - NSF East Asia Pacific Summer Institute Fellowship

**Ying Zhou** - Santos Go Award

## Faculty Honors

**Al Crosby** - Early Career Achievement Award, Northwestern University

**Todd Emrick** - ACS Fellow; Carl S. Marvel Creative Polymer Chemistry Award; National Academy of Inventors

**Ryan Hayward** - Princeton Honorary Lectureship; Dillon Medal, APS Division of Polymer Physics

**Thomas Russell** - Doctor Honoris Causa, Universite Catholique, Louvain

**Shaw Ling Hsu** - Distinguished International Scholar Award, Society of Polymer Science, Japan

**Greg Tew** - American Institute of Medical and Biological Engineering, Fellow

**Alumni Honors** - We are always pleased to highlight notable accomplishments and honors of our alumni. If you have any items you would like us to share in an upcoming newsletter, please contact the editor at [grason@mail.pse.umass.edu](mailto:grason@mail.pse.umass.edu).

## Alumni Giving

We are always so grateful for the generous support of our alumni, and especially so during this first year of the PSE50 campaign. The most recent contributors, who made gifts from Jan. 2012 to Nov. 2014, are listed below, with \* denoting gifts in multiple years and **P** indicating donors to PSE50. Thank you!

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